



# **Overview of the Rocky Flats Site Annual Report of Site Surveillance and Maintenance Activities**

## **Calendar Year 2007**

Rocky Flats Stewardship Council

May 5, 2008



## **Five-Year Review**

### **Second Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Five-Year Review**

- Covered May 2002 to April 2007**
- Final Report dated September 2007**
- Report is available on the Rocky Flats website  
([www.lm.doe.gov/land/sites/co/rocky\\_flats/rocky.htm](http://www.lm.doe.gov/land/sites/co/rocky_flats/rocky.htm))**
- Based on this review the remedy remains protective of human health and the environment.**



## Site Status

- **Notice of Partial Deletion for the Peripheral Operable Unit (OU) (POU) and OU 3 (May 25, 2007).**
- **Most POU land transferred to the U.S. Fish and Wildlife Service (July 12, 2007).**
- **Five-Year Review addressed the Central OU (COU).**



# Surface-Water Monitoring and Operations

**CY 2007 (January – December)**



George Squibb, S.M. Stoller

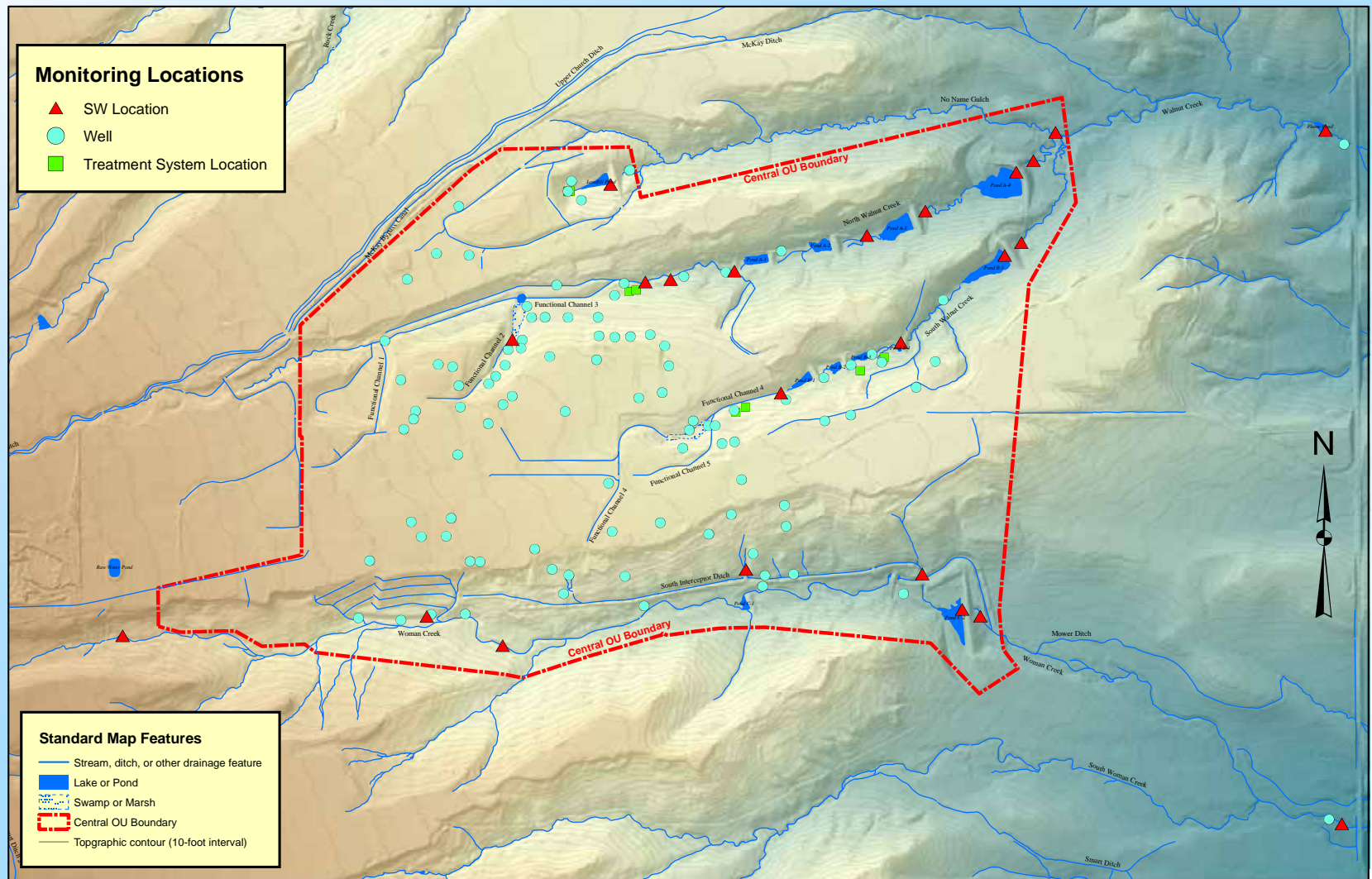


# CY 2007 Environmental Monitoring Locations

Surface Water Locations: 23

Groundwater Wells: 100

Treatment System Locations: 10







# CY 2007 Highlights: Surface-Water Monitoring and Operations

- Collected 201 samples including 130 composites comprised of 7,074 grabs
- Discharged terminal ponds A-4 and B-5 twice each during CY 2007





# CY 2007 Highlights: Surface-Water Monitoring and Operations (continued)

- Water quality at all Points of Compliance (POCs) below applicable standards
- Water quality at all Points of Evaluation, except GS10, below applicable standards
  - Reportable values for total uranium (U) at GS10, likely caused by groundwater contributions of naturally occurring uranium to South Walnut Creek





# CY 2007 Highlights: Surface-Water Monitoring and Operations (continued)

- Surface-water quality results supporting Original Landfill (OLF) indicate remedy functioning properly
- Surface-water quality results supporting Present Landfill (PLF) indicate remedy functioning properly







# Pond Operations – CY 2007

- Terminal Pond Discharges
  - Pond B-5 to Walnut Cr.
    - 3/1-3/13 (7.5MG)
    - 7/5-7/12 (3.1MG)
  - Pond A-4 to Walnut Cr.
    - 3/1-3/13 (10.3MG)
    - 7/5-7/26 (10.4MG)
- Transfers
  - Pond A-3 to A-4
    - 1/10-1/24 (5.7MG)
    - 2/7-2/12 (5.0MG)
    - 3/13-3/28 (7.7MG)
    - 4/25-5/4 (7.5MG)



## Current Pond Levels (4/17/08)

- Landfill (24.5%)
- A-3 (8.7%)
- A-4 (15.4%)
- B-5 (27.3%)
- C-2 (18.9%)



# Hydrologic Data – CY 2007

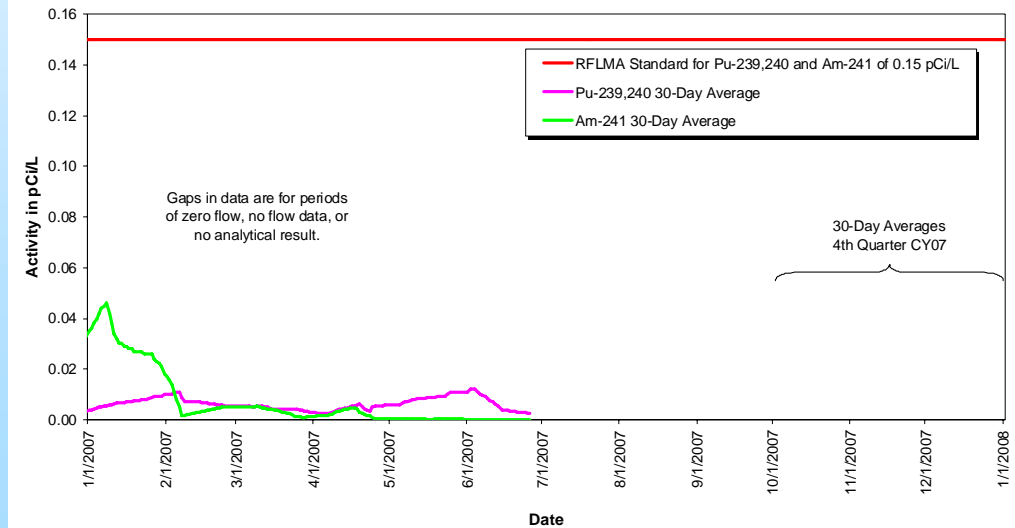
- Precipitation
  - 11.55” total precipitation
  - 92% of CY93-06 average
- Flow Rates  
(percent of CY97-06 average)
  - GS01 (244%)
  - GS03 (42%)
  - GS10 (45%)
  - SW027 (54%)
  - SW093 (69%)



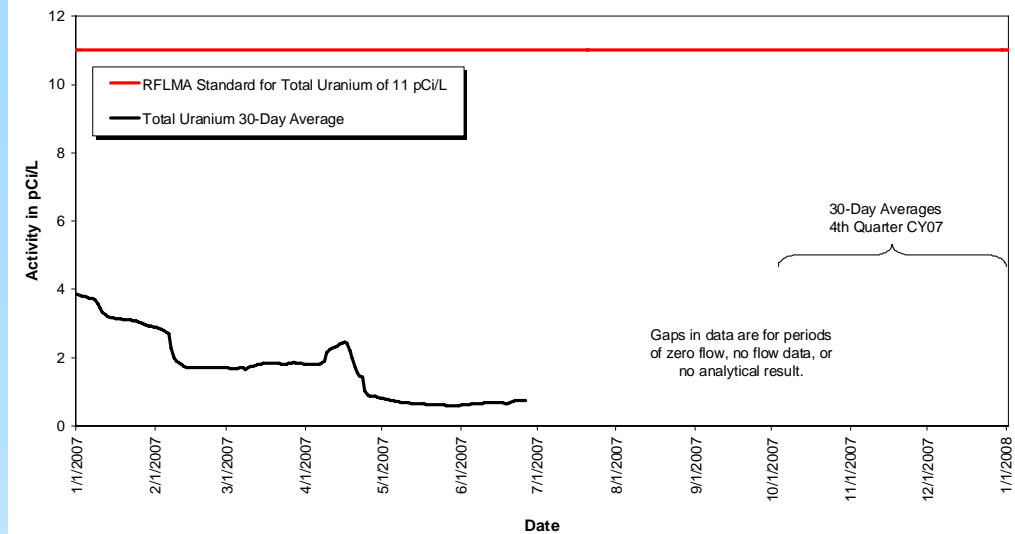


# POC GS01

- Plutonium and Americium



- Total Uranium

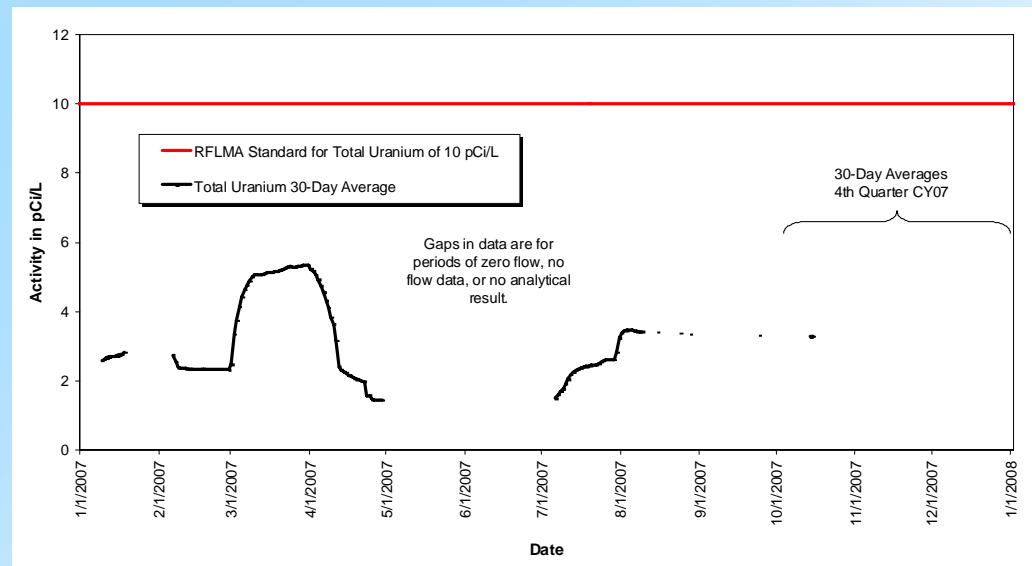
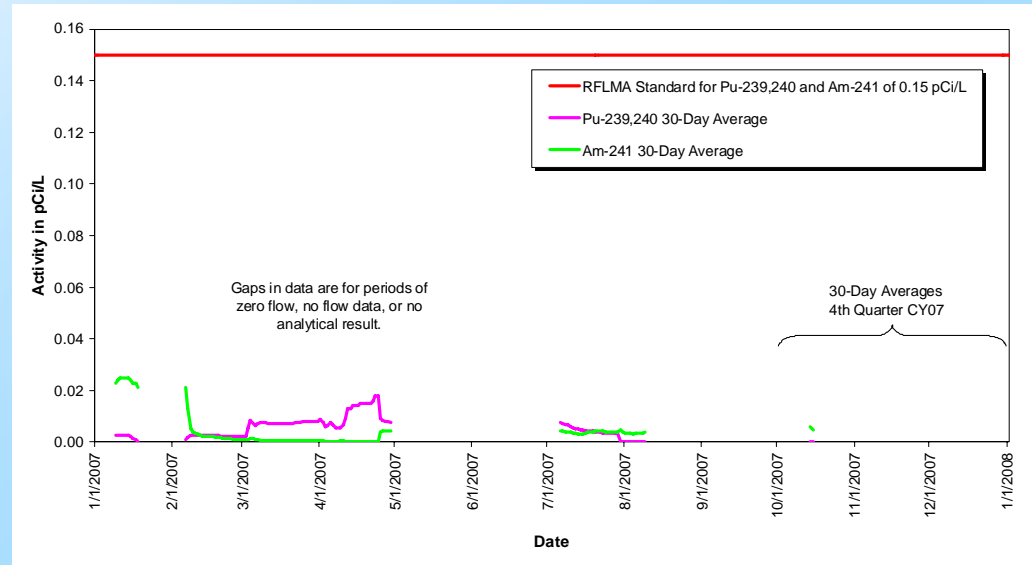




# POC GS03

- Plutonium and Americium

- Total Uranium and Nitrate + Nitrite as N



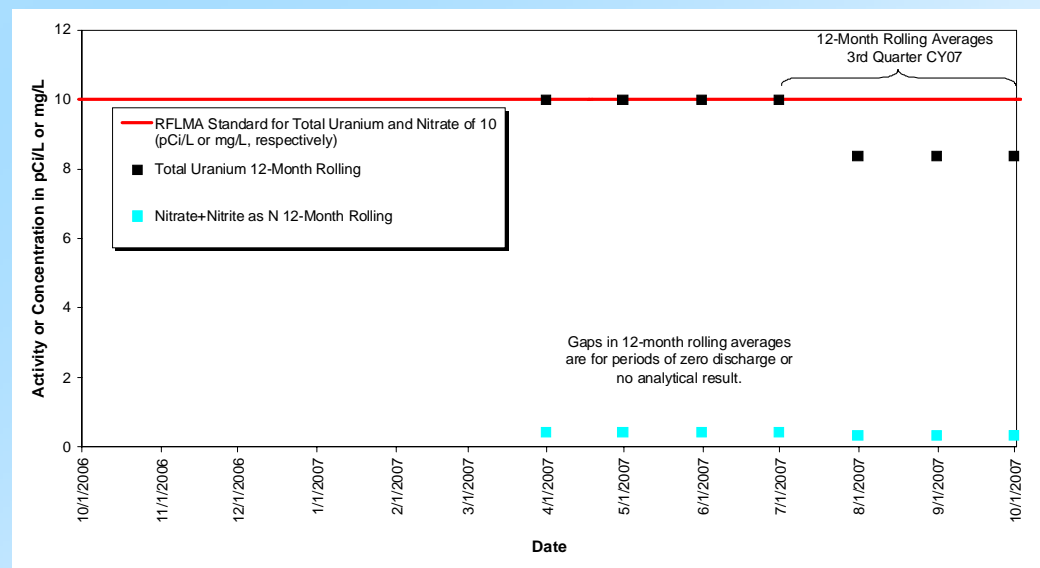
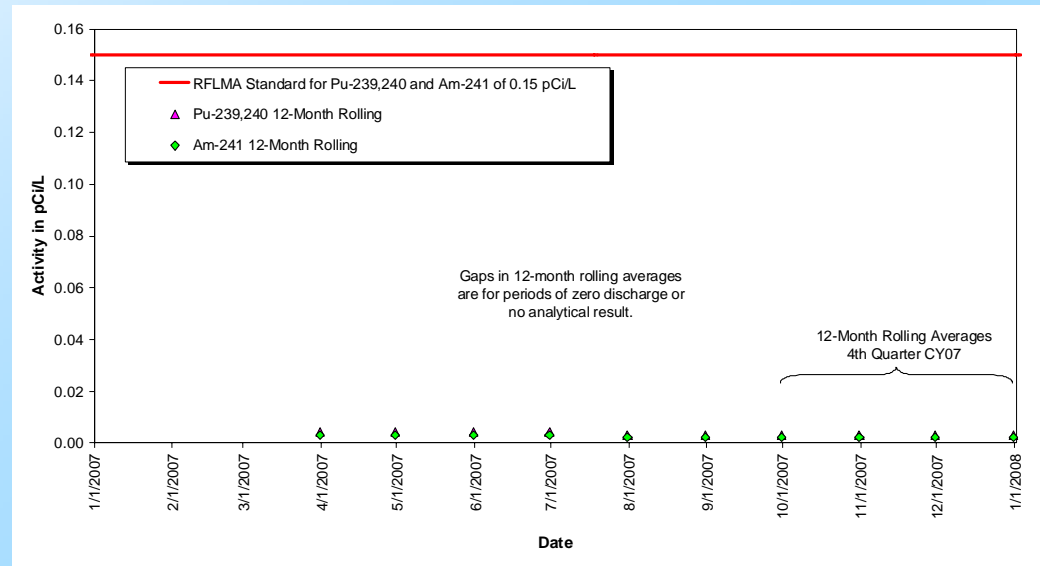




# POC GS08

- Plutonium and Americium

- Total Uranium and Nitrate + Nitrite as N

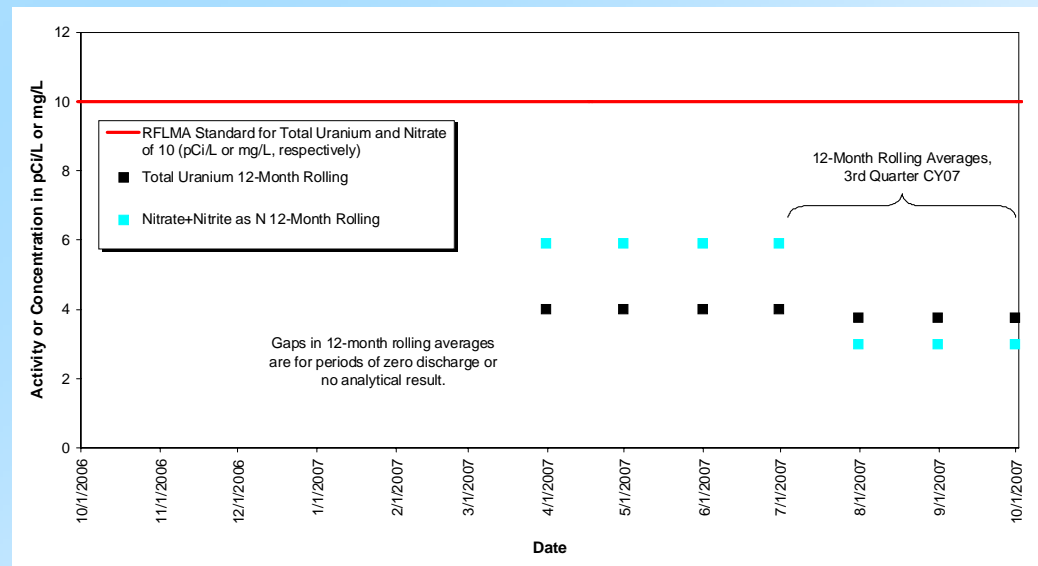
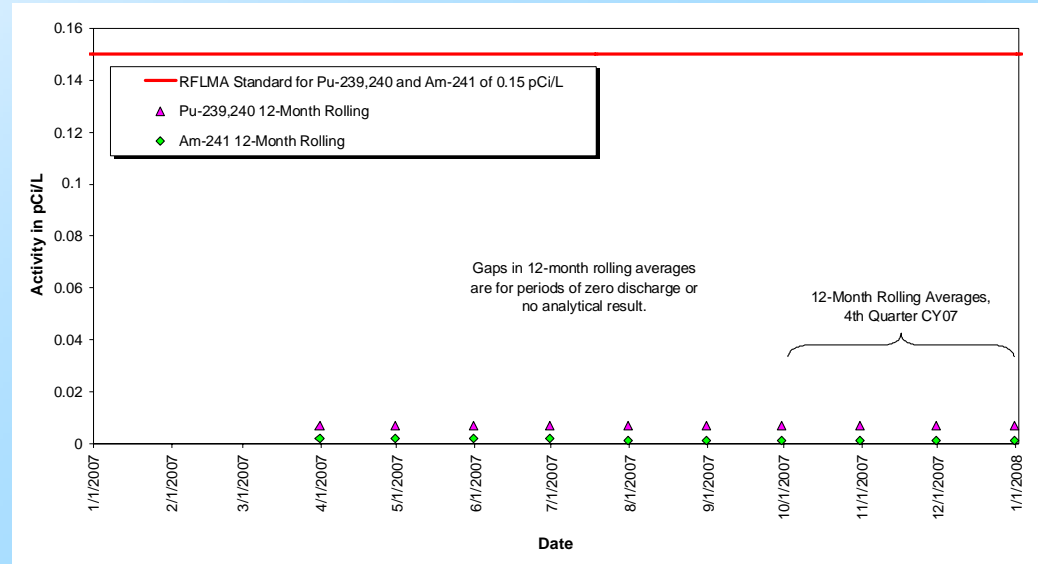




# POC GS11

- Plutonium and Americium

- Total Uranium and Nitrate + Nitrite as N





# POC GS31

- Plutonium and Americium

No Pond C-2 discharge during CY 2007.

- Total Uranium



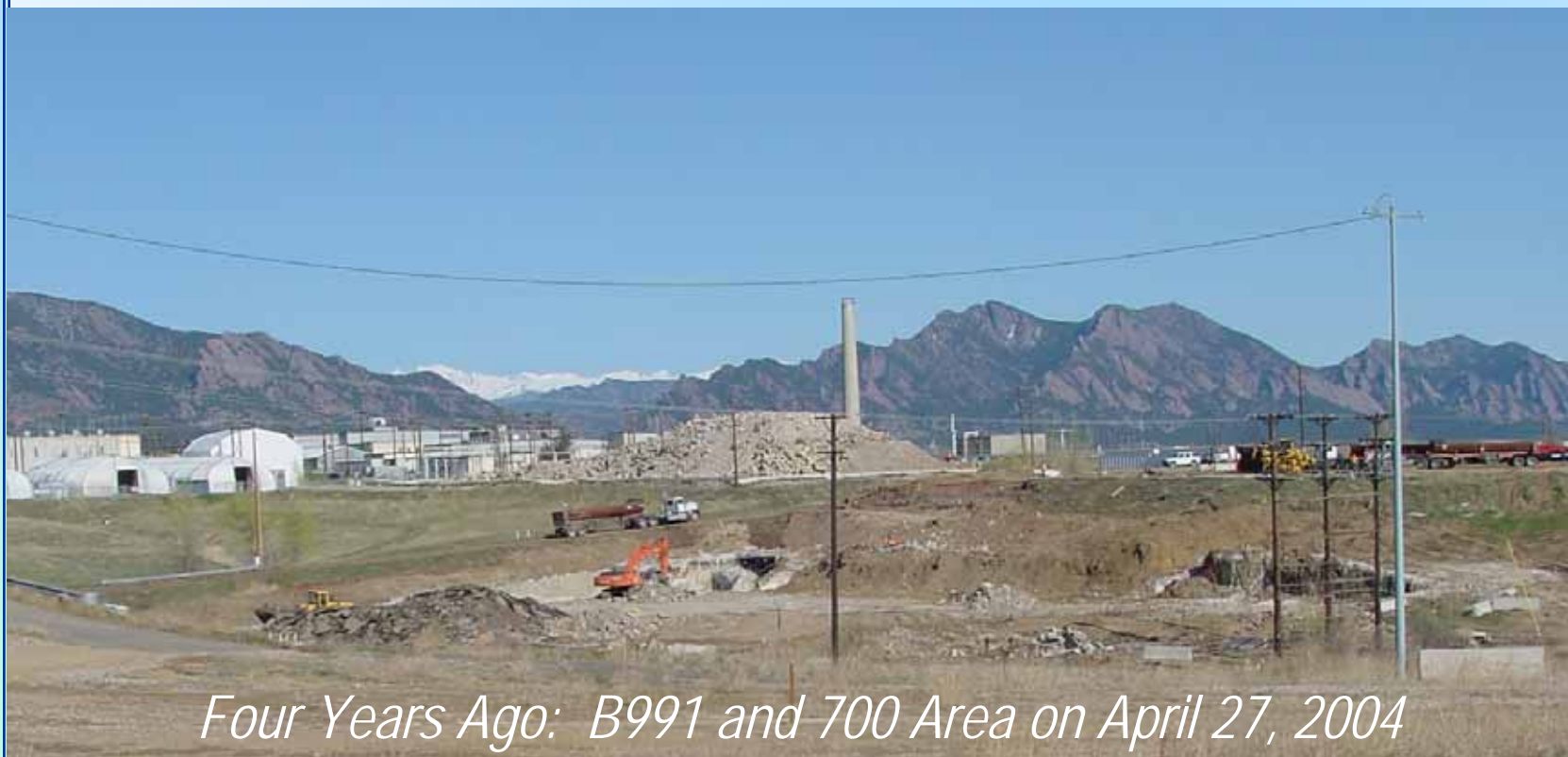
# Questions?







# Groundwater Monitoring



*Four Years Ago: B991 and 700 Area on April 27, 2004*

4<sup>th</sup> Calendar Quarter/Annual 2007

John Boylan



# RFLMA Groundwater Monitoring, 4CQ07

- Rocky Flats Legacy Management Agreement (RFLMA) 4<sup>th</sup>-quarter monitoring includes
  - Area of Concern (AOC), Sentinel, and Resource Conservation and Recovery Act (RCRA) wells
  - Groundwater treatment systems
- All locations sampled as scheduled
- Analytical results consistent with previous data
- Sentinel well 45605 (slump) abandoned following sampling



# Non-RFLMA Groundwater Monitoring, 4CQ07

- Collected additional performance-check samples at treatment systems
  - Sampled Mound Site Plume Treatment System (MSPTS) and East Trenches Plume Treatment System (ETPTS) (influent, effluent) to determine whether change to upflow configuration affected treatment efficiency
    - No significant effect observed
    - Returned to downflow
  - Samples at downgradient Solar Ponds Plume Treatment System (SPPTS) locations (Discharge Gallery [DG], GS13) collected to support Colorado Water Quality Control Commission (WQCC) discussions



# Groundwater Conditions in CY 2007

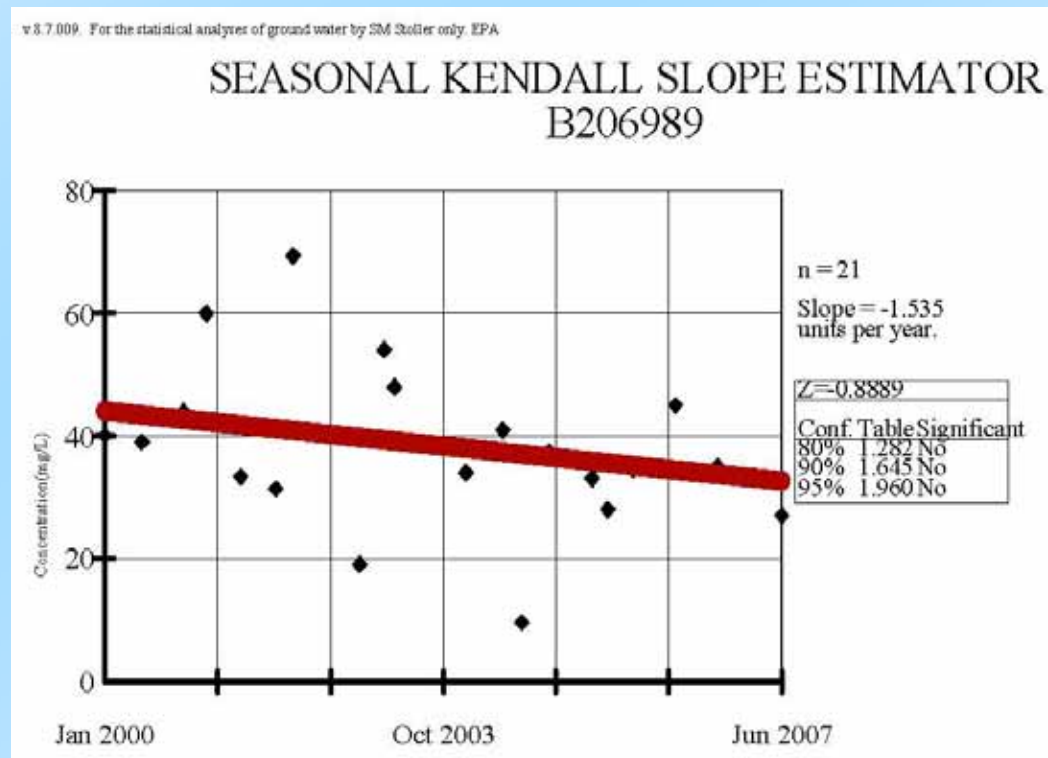
- Contaminant plumes consistent with conditions in 2006
- Groundwater flow as predicted prior to closure
- Potentiometric surface and flow conditions very similar to pre-closure
- Post-closure hydrologic regime is equilibrating





# Groundwater Conditions in CY 2007

- Recordable condition at AOC well B206989
  - Nitrate, consistent with previous data
    - Not previously reportable because well was classified as a Sentinel well until RFLMA was signed





# Groundwater Conditions in CY 2007

- Groundwater Treatment Systems
  - Continued to treat intercepted groundwater and remove contaminants
    - MSPTS shows strong influence from Oil Burn Pit #2
    - ETPTS media crust is thick, may replace in 2008
  - No major maintenance performed in 2007
  - Performed several studies/evaluations
    - Upflow vs. downflow at MSPTS and ETPTS
    - SPPTS treatability studies, Interceptor Trench Pump House (ITPH) potholing, DG flow monitoring, and telemetry improvements
  - Evaluating path forward for SPPTS (long-term maintenance costs, DG water quality)



# Groundwater Conditions in CY 2007

- Other groundwater-related studies
  - Updates to several groundwater models
    - Confirmed groundwater flow is consistent with pre-closure predictions
  - Concluded “no-purge” sampling evaluation
    - Determined this sampling method will not be used at Rocky Flats



# Groundwater Conditions in CY 2007

- RCRA well evaluations require comparison of upgradient-downgradient water quality and trending
  - PLF fundamentals: Downgradient concentrations higher than upgradient AND on an increasing trend trigger consultation
    - 2007: Two downgradient wells higher in boron (B) and selenium (Se), all three higher in U
    - B consistently below RFLMA Table 1 surface water standard (750 micrograms per liter [ug/L])
    - Se consistently above RFLMA Table 1 surface water standard (4.6 ug/L)
    - U typically below RFLMA threshold (120 ug/L)
    - No trends can be calculated due to insufficient data
    - SUMMARY: Conditions in 2007 similar to 2006, with fewer metals exhibiting statistically higher downgradient concentrations and no volatile organic compounds detected downgradient



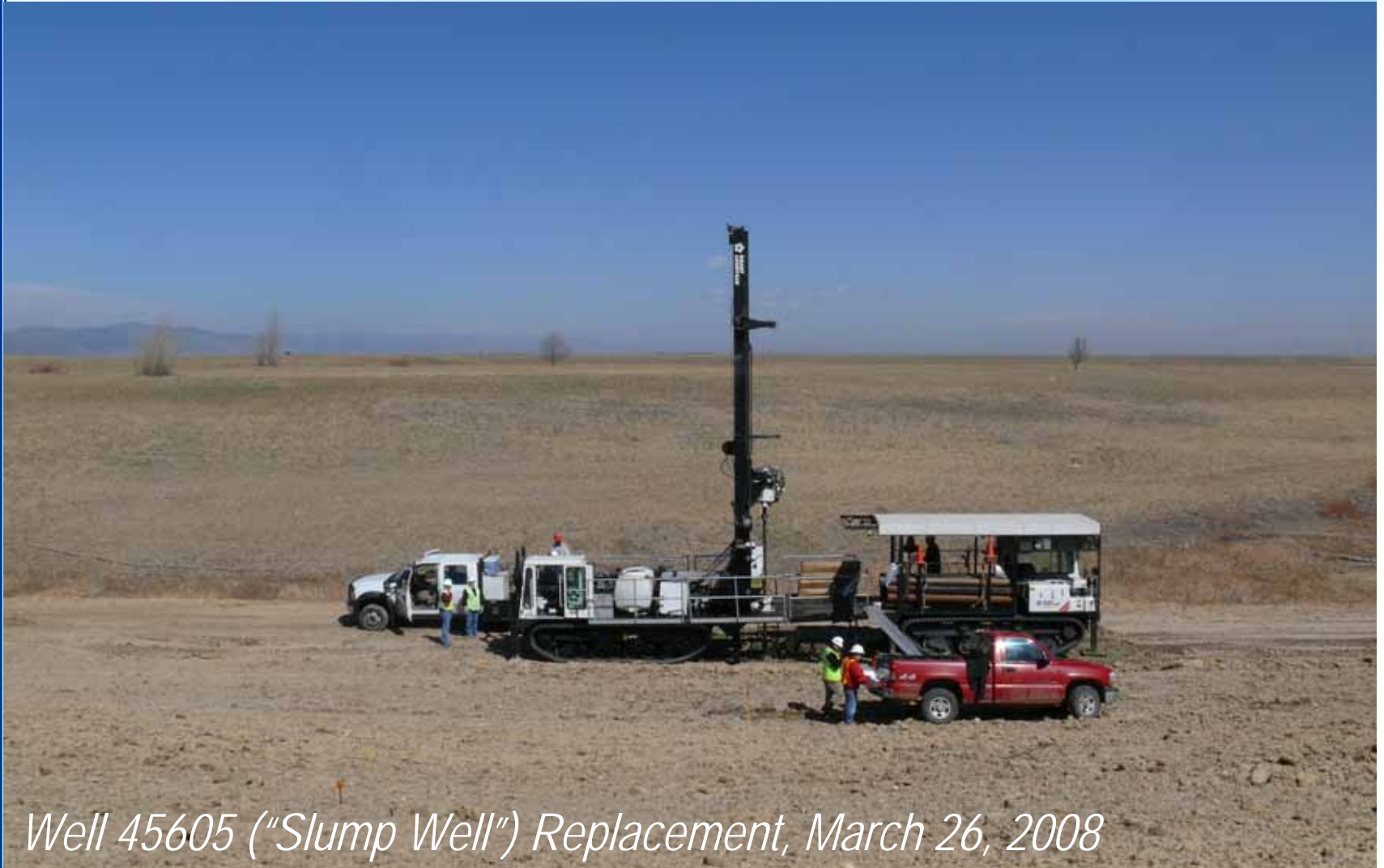


# Groundwater Conditions in CY 2007

- RCRA well evaluations, continued
  - OLF fundamentals: Downgradient concentrations higher than upgradient OR on an increasing trend trigger consultation
    - 2007: All three downgradient wells higher in B, one higher in U
    - B consistently below RFLMA Table 1 surface water standard (750 ug/L)
    - U consistently below RFLMA threshold (120 ug/L)
    - Per CERCLA 5-year review and 2006 Annual Report, analyzed sample for isotopic U signature; results were 100% natural U
    - No trends can be calculated due to insufficient data
    - SUMMARY: Conditions similar to 2006, with fewer metals exhibiting statistically higher downgradient concentrations



# Questions?



*Well 45605 ("Slump Well") Replacement, March 26, 2008*



# Update on WQCC Rulemaking

- Petition to adopt statewide basic U standard (MCL 30 ug/L ~ 20 pCi/L): Hearing 1/09
  - Natural U in ground water now higher proportion of surface water (LANL samples completed)
  - Eliminate site-specific standards (10 pCi/L Walnut Creek; 11 pCi/L Woman Creek)
- Expiring Temporary Modifications (TMs) Review (New rule): Hearing 12/07
  - No changes to current Rocky Flats TMs



# Update on WQCC Rulemaking (cont.)

- Triennial Review S. Platte River Basin
  - Issues Scoping Hearing 10/07
    - Rocky Flats TMs expire 12/31/09
    - New statewide basic standard for arsenic (10 ug/L) below site-specific standard (50 ug/L)
    - Will CDPHE adopt new EPA method for copper or other metals?
    - Uranium petition already scheduled for rulemaking
  - Issues Formulation Hearing 11/08; Rulemaking Hearing 6/09

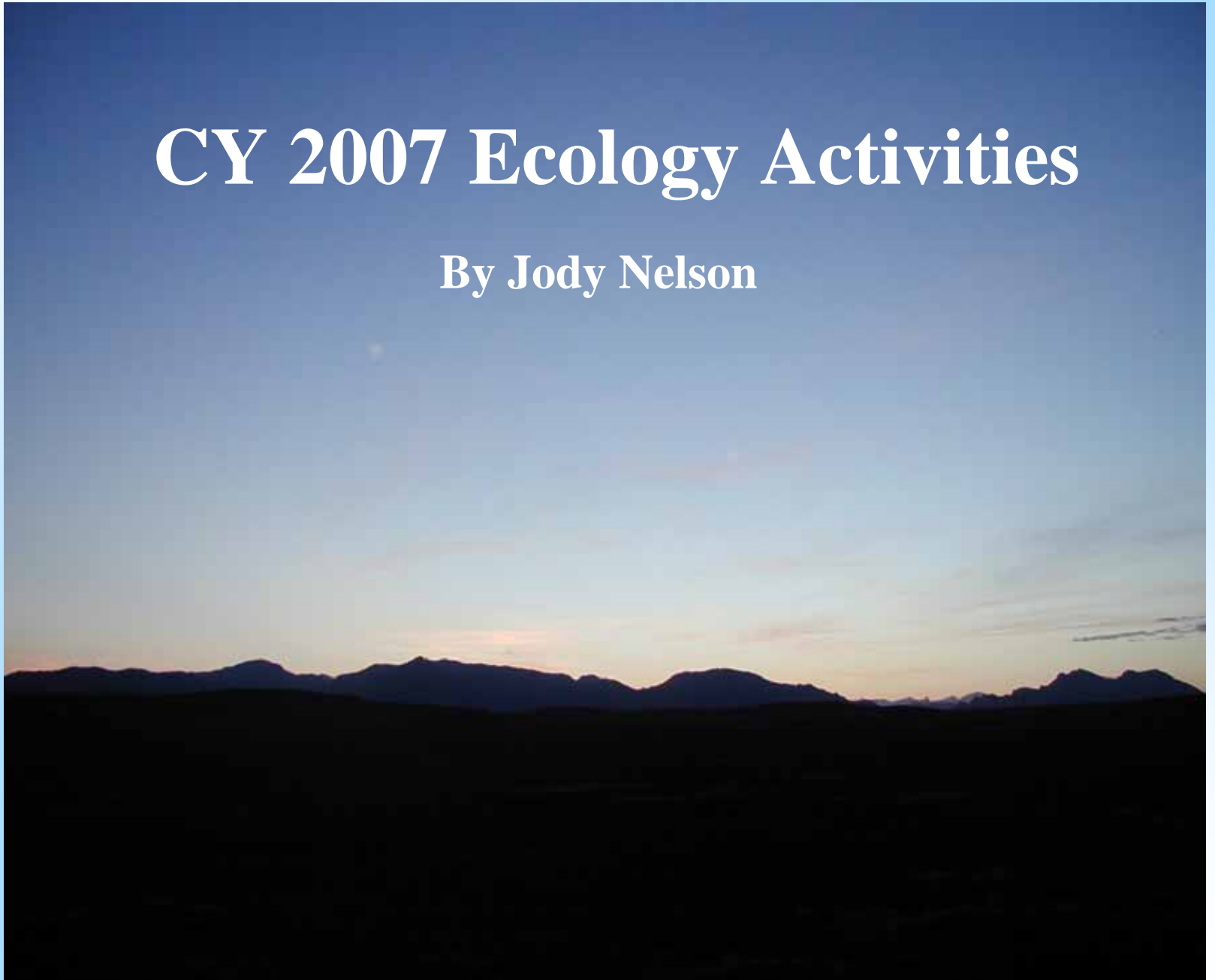


Questions?



# CY 2007 Ecology Activities

By Jody Nelson







# Project Assistance

Project support for ecological issues was provided for the:

- Roads III Project
- Functional Channel (FC)-1/B371 Excavation/Fill Project
- 991 Slump Repair
- Annual Dam Mowing and Riprap Spraying Project
- Solar Ponds Potholing Project
- COU fence construction





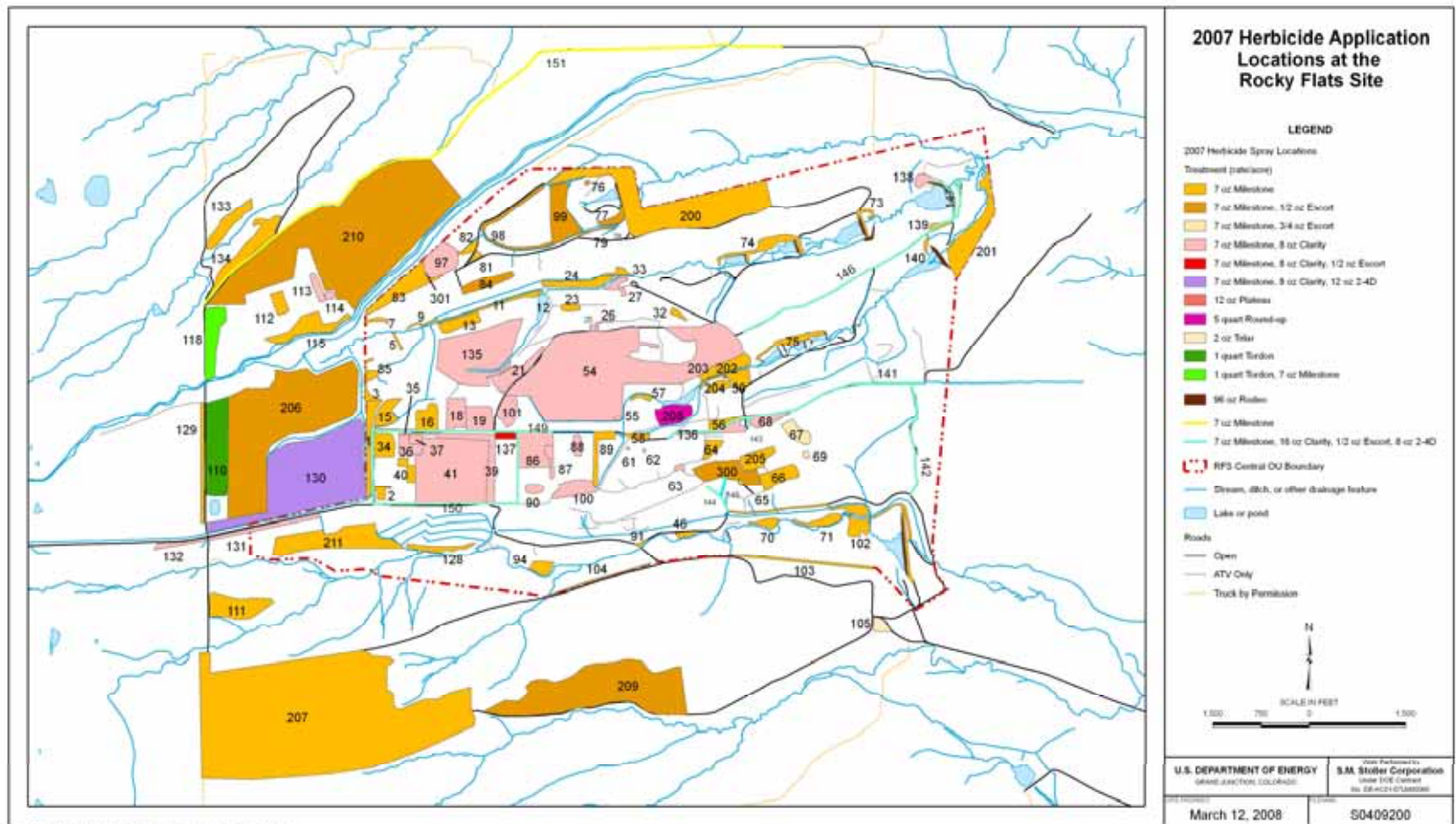
# Ecological Monitoring

- OLF and PLF monthly vegetation surveys
- Monthly weed surveys in the mitigation wetlands
- Revegetation monitoring
- Weed monitoring/mapping
- Preble's mouse mitigation monitoring
- Wetland mitigation monitoring





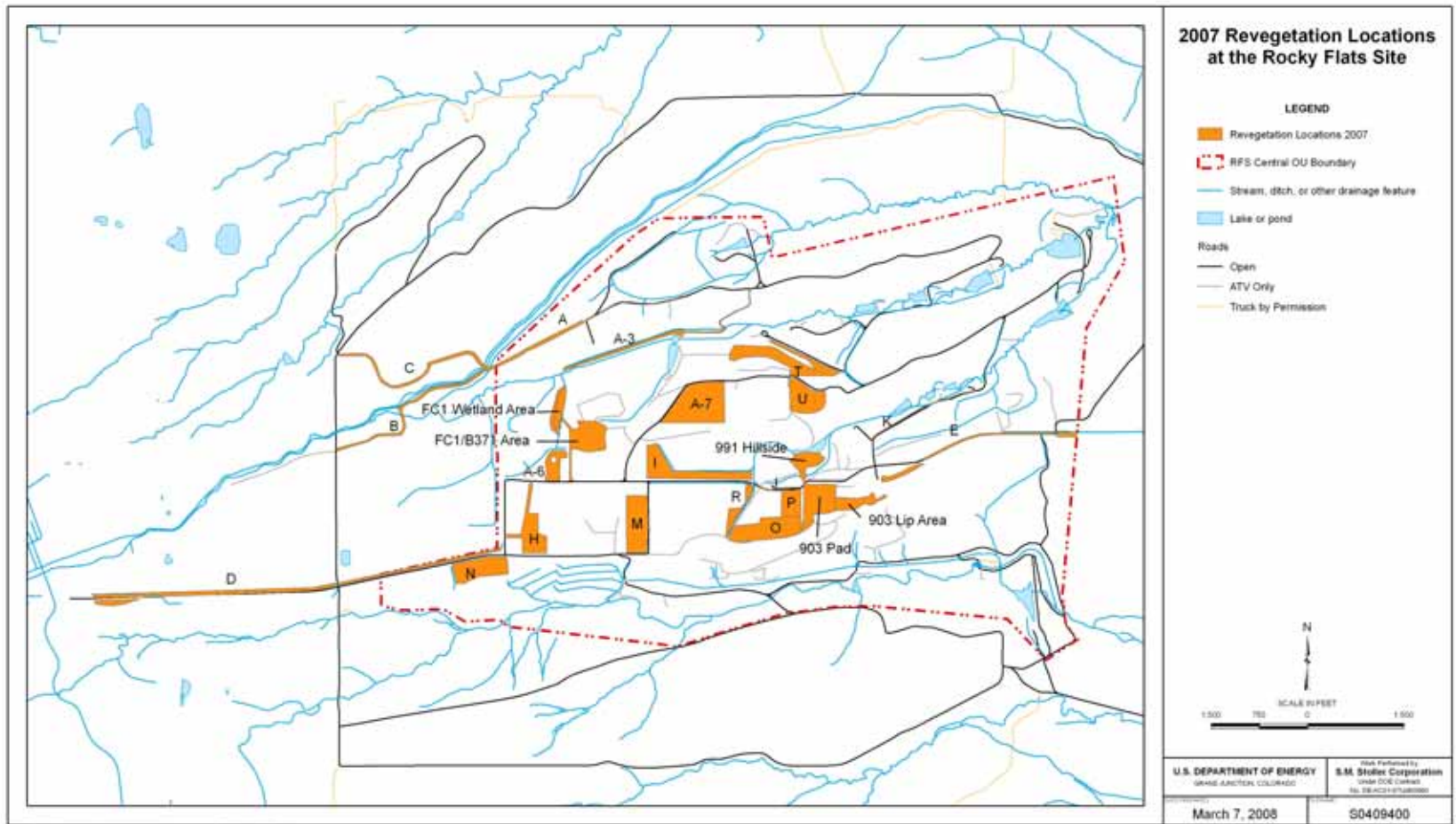
# Weed Control







# Revegetation Activities

















Questions?



# Site Operations and Maintenance CY 2007







# Site Operations

- **PLF**
  - Eleven inspections performed in CY 2007
  - Changed inspection frequency from monthly to quarterly in November 2007 according to revisions in PLF Monitoring and Maintenance (M&M) Plan
  - **No significant concerns**





# Site Operations

- **PLF - Settlement Monuments**
  - Installed in August 2006
  - 15 monuments on landfill cover
  - Quarterly surveys completed in March, June, August, and December
    - Movement within calculated settlement data per M&M Plan







# Site Operations

- **OLF**
  - Twelve inspections performed in CY 2007
  - Followed prescribed checklist in M&M Plan





# Site Operations

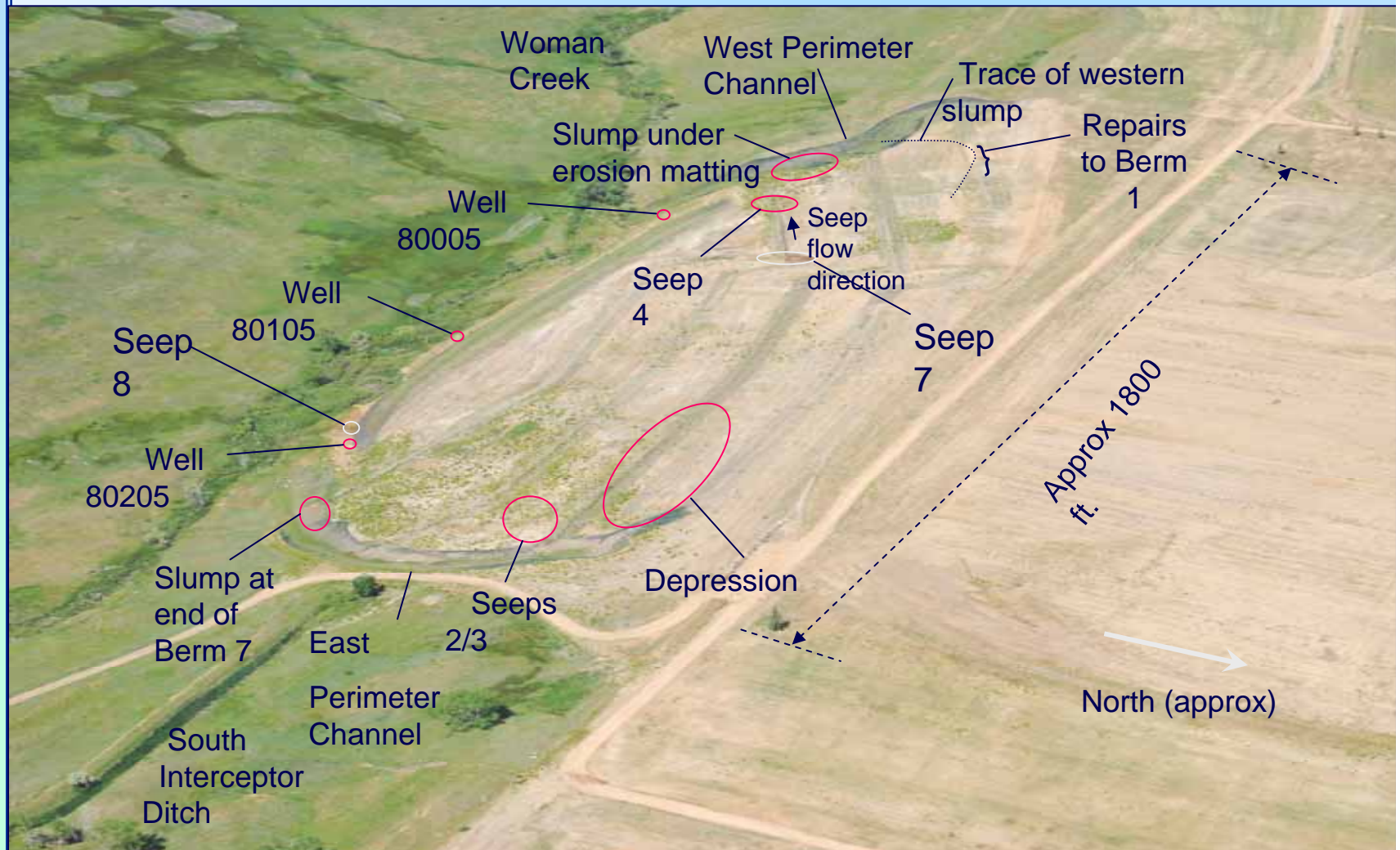
- **OLF - Settlement Monuments**
  - Seven settlement monuments installed
  - Quarterly survey completed in June, August, and December 2007
    - Movement within calculated settlement data per M&M Plan





# Site Operations

- **OLF –Seeps, Slumps, Berm Areas**





# Site Operations

- **OLF - Seeps**

- Seeps #4, #7, and #8 showed areas of active groundwater seepage throughout most of the year.
- Smaller seeps only present temporarily after precipitation events







# Site Operations

- **OLF - Slumps**
  - Berm #1 Slump
    - Documented February 7, 2007
    - Berm was repaired on April 12 and May 7, 2007
    - Final repairs completed on August 2, 2007





# Site Operations

- **OLF - Geotechnical Investigation**
  - Project designed to evaluate mechanisms for movement and/or settlement of landfill cover
  - Phase 1 (geophysical survey) was completed on December 6, 2007
  - Investigate locations of waste beneath cover with seismic and resistivity equipment
- **Phase II Test Pits and Boreholes in 2008**
  - Stability Analysis Report and recommendations





# Site Operations

- **OLF - Consolidation Monitors**
  - Twenty consolidation monitors installed on September 19, 2007
  - Evaluate movement in Berm #1 slump area
  - Surveyed monthly





# Site Operations

- **Slump South of Former Building 991**
  - Slump Regrade Project completed on November 20, 2007
  - Excess material hauled to 903 Pad for revegetation efforts
  - Installed 13 consolidation monitors to assess future movement





# Site Operations

- **Building 371 Regrade**
  - Project designed to improve drainage into FC-1 and FC-2
  - Grading and revegetation activities completed on September 22, 2007





# Site Operations

- **COU Fence**

- Construction completed on March 22, 2007
- RFLMA-required “No Trespassing” signs attached on March 23 – inspected quarterly
- Fence flags hung in May 2007 to help make fence more visible to deer





# Site Operations

- **Road Upgrades**
  - Upgrade projects completed April 3, June 1, September 28, and November 26, 2007
  - Constructed water management structures and applied drain rock and road base







# Site Operations

- **Access/Security**

- Patrolled internally approved routes as well as outer perimeter routes
- No significant concerns





# Site Operations

Questions ?

